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ABSTRACT

This paper reports on the development of an error-coding instrument and a computerized continuous feedback system for the diagnostic evaluation and remedial treatment of unstructured second-language performances and the use of such a system in an instructional setting. The system does the following: it allows quick, objective, accurate, and detailed evaluation of "creative" written and spoken German; it provides student performance files in the structural and phonological elements of the language that can be updated as required; it allows accurate performance-to-performance comparisons of progress; it permits the instructor to determine quickly the learning status of an individual student, a group of students, or the entire class, and subsequently to design appropriate exercises for that particular target group; and it allows students to judge their performance from the same criteria which were available to their instructor for marking. Feedback procedures and a tabulation of errors for three levels of German language instruction are presented and their systemic implications for the design of pedagogical grammars are discussed. (Author/KM)

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SYSTEMATIC PERFORMANCE ANALYSIS IN FOREIGN LANGUAGE INSTRUCTION

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Introduction

I should like to report to you on the development of an error-coding instrument and a continuous-feedback system for the diagnostic evaluation and remedial treatment of unstructured second-language performances & the use of such a system in an instructional setting.

The notion of performance analysis arises from several contemporary concerns in second-language teaching which, in my opinion, require a restructuring of traditional approaches to the evaluation of student learning. These issues are error analysis, a distinction between the concepts of competence and performance, an insistence on meaningful practice in real communication, and a related emphasis on individualization of instruction by specification of performance objectives.

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Because of the time limitations here I cannot discuss in detail the research background and the relevant professional literature; instead I will outline the principles involved in the form of generalizing statements which embody current research.

Research background

(1) Because of recent psycholinguistic insights in language acquisition and language use, the strong claim of contrastive analysis for exhaustive predictive power has been replaced by

postulating a weaker, explanatory function, and contrastive analysis has been complemented by the more comprehensive concept of error analysis. This notion has had immense effects on applied linguistics "theory" as well as on second-language teaching itself, and a large number of books and articles have been devoted to a theoretical analysis of the issues and their pedagogical implications. (e.g. Corder, 1967; Duskova, 1969; Wardhaugh, 1970; Nemser and Slama-Cazacu, 1970; Selinker, 1970; Buteau, 1970; Corder, 1971; Nemser, 1971; Selinker, 1971; Whitman and Jackson, 1972; Richards, 1972; Selinker, 1972; Dulay and Burt, 1972; Politzer and Ramirez, 1973; Khampang, 1974; Schachter, 1974; Bailey, Madden and Krashen, 1974; Scott, 1974; George, 1972; Richards, 1971; Burt and Kiparsky, 1972; Smith, 1971; Valdman, 1973)

(2) Linguists deal, for the most part, with various aspects of competence; language teachers have to deal, for the most part, with its manifestation in performances (Di Pietro, 1970), but an analysis of a speaker-hearer's incorrect performances, it is claimed, can give valuable clues as to what went wrong either in the internalization of linguistic structure itself or in its representation in speech (Joiner, 1974, p. 155; Corder, 1967; Quinn, 1974, p. 348; Valdman, 1973).

(3) If a student's performance is a realization of his competence in a second language in decoding or encoding speech, then the aim of instruction must be the development of receptive and productive competence (Di Pietro, 1971, p. 19) in communication of some sort. High organization and meaningfulness of the

communication appear to facilitate the acquisition process (Oller, 1972; Rivers, 1972, p. 66; Savigon, 1972).

(4) The teacher must be mindful of each individual student's process of internalization and externalization of linguistic competence; that means that he has to be aware of and sensitive to intervening cognitive, affective and psycho-motor factors which might facilitate or inhibit a learner's acquisition and production of a foreign language.

(5) Continuous behavioral testing in relation to performance objectives to inform and motivate the student and to alert the teacher to learning problems being encountered by an individual student or by the class as a whole is virtually a necessity if the teacher wants to adequately guide a student's progress in an individualized setting (Clark, 1972, p. 227).

(6) Traditional testing approaches have, mostly for administrative, not pedagogical reasons, tended to focus on an evaluation of a student's competence in structured situations (Clark, 1972, p. 231), but proficiency in communication (i.e. communicative competence as well as linguistic competence) can only be assessed validly in situations where a student can meaningfully and non-mechanically interact with or at least react to a partner in communication.

(7) Remedial learning is most effective when based on a systematic evaluation of such a performance.

Specifications of the coding and feedback system

With these generalizations in mind, an anlysis and feedback system was constructed and field-tested which had to satisfy

the criteria of exhaustiveness, explicitness, accurateness, efficiency, effectiveness and open-endedness for its structural design.

Description of the coding and feedback system

What follows is a description of the error-coding and feedback system in general, as well as a brief illustrative report on its use in Beginning, Intermediate, and Advanced German language classes at the University of Alberta. Pertinent information regarding the numbers of students involved, corpus size, and numbers of errors observed is given on the Hand-out. The corpus was obtained from short paragraphs and essays and from tape-recorded, regularly scheduled conversations between students and the instructor.

A general distinction was made between an error in linguistic form (e.g. "correct past tense suffix") and an error in the proper use of the linguistic form (such as "correct use of the past tense"). There were 260 codes in the linguistic form, 85 codes in the proper use category, and 65 codes in the phonology group. Errors were coded, with one exception, in terms of intralingual contrasts, that is, they were coded in terms of what the linguistic form or its use should have been as compared to what was observed.

In order to retain optimal amounts of structural information, errors were classified in a hierarchy of decreasing specificity, i.e. if a very specific error definition was unambiguously possible it was coded as such; otherwise a lower level of specificity was employed; for example, "capitalization", "correct

ending of a noun in the dative plural", "correct past tense suffix", or "correct stem of a past participle" versus "spelling". Unambiguity then referred to the least amount of guessing as to the student's reasons for using a certain structure; in this way, it was hoped that a non-interpretive data base could be assembled which, if so desired, could then be used for causal error analysis. Illustration 2 on the Handout provides some excerpts from the coding sheet. Some of the error codes can be criticized as not meeting rigorous standards of linguistic definition; however, as was done by Politzer and Ramirez (1973), scientific precision was sacrificed occasionally for pedagogical considerations if the output was to be immediately meaningful and consequently useful to the student.

Data Processing

After coding, the errors were processed by means of a specially prepared computer program which outputs the following information. Illustrations of each type are provided on the Handout.

(1) An Error-Word Ratio: By converting the number of errors into a ratio of errors per every one hundred words, differences in the length of essays, paragraphs or oral performances are compensated for; the ratio consequently allows comparisons of overall performance between samplings taken from one or more students' performances.

(2) Individual Error Profile: This is a list of individual errors for each student which is updated with a new record; it contains the actual number of errors, the percentage of the total

number of errors accounted for, and the verbal descriptor. The profile pinpoints occurences of specific errors for the student and the instructor.

(3) Error Cluster Profile: 56 clusters were compiled of errors which are based on a common principle and which resemble major headings in second-language instruction, e.g. "correct word order"; "correct form and/or use of relative pronouns"; "correct choice of word in situational context". This cluster analysis was devised because it is conceptually more useful to students and the instructor to do remedial practice in "endings of der-words" rather than exercises in "the accusative singular of a der-word after a preposition". It is clear that the remedial exercise will center around the actually observed cases of errors, but will also extend to other areas from which negative transfer can be expected.

(4) Individual Error Summary for all students at the last performance sample: This table summarizes all errors across all students in a given course and allows the instructor to tell at a glance which areas of structure and phonology should be dealt with remedially before the next sampling.
The category "number of students making a given error" was introduced here so that the instructor may know if, for instance, a given error whose frequency of actual occurrence was 5, was made by one student only, by two, or by five different students. The error dispersion number consequently permits the instructor to judge from the summary list if he has to administer remedial exercises to the class as a whole, to a sub-group, or to one

student only.

(5) In the Error Cluster Summary for all students at the last performance sample the instructor can isolate major groups of errors and their dispersion over the entire class.
Finally, summary outputs are produced cumulatively of each of the above types for all students in a given course and all performance samples. With these, the instructor can keep tabs on the long-range development of students' progress over the school year and he can, on this basis, anticipate potential problem areas in subsequent years. Illustration 8 on the Hand-out provides an example of a Cumulative Error Summary.

Data feedback

After the data collection, every attempt was made to return the computer print-outs to the students and the instructor as soon as possible; in most cases, the waiting period for the feedback data was only one day.

Throughout the feedback process, the emphasis was on the student as an active partner in evaluation rather than as the passive recipient of an externally imposed testing system (Clark, 1972, p. 230). Following George's (1972, pp. 73-78) discussion of remedial strategies, it was considered important that the students, as a first step in error extinction, be able to discriminate between unwanted and wanted items. Students were therefore asked to focus their attention on two types of data, viz. errors in areas in which the student had been doing remedial work, and secondly, on errors in those areas which had recently been introduced in class. The former were to provide

feedback on the effectiveness of previous remedial learning; if such errors did not occur any more or in lesser frequency the student would presumably be positively reinforced and would, as a result, be motivated to use similar strategies for new errors. Consequently, students would look at remedial learning as an integral component of the total instructional process rather than as an exercise for catching up with the others in the class. As George (1972, p. 73) puts it, "unless the remedial work results in a strong sense of achievement there is likely to be only perfunctory performance of remedial exercises, and consequently little improvement".

Conversely, of course, negative reinforcement will be provided if the error frequency had not diminished significantly. It is of great importance therefore that the instructor, by means of performance files, keeps track of the effectiveness of instruction and remediation for each individual student over the longer term and that he design teaching strategies accordingly.

For an interpretation of their performance records, students were instructed to ignore frequencies of 1 as most of those were probably performance errors which they might have corrected themselves if given the opportunity to do so; in any event, larger error frequencies are more likely to be genuine errors indicating deficiencies in the student's competence (Valette and Disick, 1972, p. 43). As the next step, students checked the individual error profiles for persistent occurrence of incorrect items. The process of cognitive focussing was continued by having the students try to become clear in their minds, either on their own or with the

help of the instructor, about the question what the correct form or usage should have been; then the students were asked to test out their new insight in practice, and finally, students were told to concentrate on the correct use of that particular item at the next written or oral performance sampling.

The instructor proceeded similarly in the interpretation of the data. He checked the error profile for the class as a whole and noted major error frequencies and the number of students making a certain error. Then he analyzed the cumulative records of individual students for persistently occurring errors; again, most attention was paid to errors in recently introduced or reviewed areas of the language. Selection of unwanted items for remedial treatment was a function of error frequency, dispersion, persistence of occurrence, and the severity of impairment of communication by a given error.

Subsequently, the instructor decided whether the error dispersion over a number of individuals warranted full-group, part-group or individualized remedial work, and prepared appropriate materials for cognitive review, manipulative, or communicative practice. Here it was important that a different approach to explanation and/or practice be taken to increase the chances for success of remediation.

Instructors were asked to keep a log of the type of remedial action selected and its apparent effectiveness and efficiency for their own use in planning the course in subsequent years. They also solicited comments from their students about the reasons for improvement or for no improvement as they saw them. In this

manner, the feedback cycle on the effectiveness of instruction was closed at the instructor.

Eliminating errors in the performance must, at some point, involve an examination of the possible reasons for the occurrence of a given error, although the question must be left open at this point how causal error analysis can be most helpful for actual classroom use. A number of meaningful explanations have been offered, in addition to the methods suggested by CA, to account for the occurrence of errors (e.g. Duškova, 1969; George, 1972; Richards, 1971; Selinker, 1969), but for the present at least, the teacher must decide in each instance whether an error was a performance slip or a competence error; he must ask himself whether the element to be learned was incorrectly perceived and incorrectly incorporated, or was it insufficiently practiced? Which one (or more) possible explanations can be given for wrong incorporation or externalization? Some errors may be reducible to native language interference, others to non-cognitive factors in the student, others again to conditions in the larning environment. Consequently, the teacher as a practitioner must remain undogmatic and must test out for himself how language works rather than accept uncritically a theorist's convictions.

Evaluation

It has been difficult to reconcile the current professional demands for as much meaningful practice of the foreign language in the classroom as possible with the demands for valid and reliable evaluation of communicative and linguistic competence demonstrated in such situations. An enormous amount of work has

been done in conceptualizing the communicative competence dimension and its evaluation (e.g. Bauer, 1971; Noss, 1971; Di Pietro, 1973; Francke, 1972; Clark, 1972; Smith, 1971; Jorstad, 1974; Labov, 1970; Oller, 1972; Cooper, 1970; Upshur, 1971; Carroll 1973; Nickel, 1974; Spolsky, 1968; Jakobovits, 1970); yet it was concluded by Briére in 1971 that what was missing then was a truly valid test to evaluate communicative competence. And without doubt, the situation hasn't changed much: it is true that more and more imaginative testing situations for communicative and linguistic competence have been devised (discussed in Clark, 1972, pp. 222-228) but evaluation has tended to be subjective and global in nature because of the difficulties involved in properly evaluating an ongoing interaction. For example, many writers (e.g. Rivers, 1972, p. 28; Francke, 1972) urge that mistakes should be noted, but not corrected during interactive practice; frequent mistakes could be discussed with the student privately or could be used as the basis for drills.

In the face of this dilemma it is quite possible that some teachers may either have given up on teaching for or evaluating communicative proficiency at all because it doesn't lend itself to objective assessment as well as do other testing approaches or they may have attracted the students' and/or department head's wrath for giving marks which were too high or too low.

Performance analysis as described here offers the teacher some benefits in this area for designing instructional sequences; three major sets of conclusions emerge from the foregoing discussion:

(1) Performance analysis combines the record-keeping and up-dating capabilities of computer-assisted instruction with increased communicative proficiency by means of meaningful practice; error files are produced which allow performance-to-performance comparisons of progress of individuals or groups of learners. Remedial instruction following performance analysis offers branching advantages similar to those obtained under programmed instruction with which the students can be brought to a comparable level of achievement. The instructor and the students know at any given time with high reliability which level of linguistic competence has been achieved and which effects, if any, instructional and remedial strategies have had as measured in terms of their effectiveness and efficiency. Statements of performance objectives such as "the student will be able to use inverted word order in unstructured writing to a criterion of 80% accuracy" can easily be validated by performance analysis.

Does the compiling, feedback and remedial treatment of errors as described here produce improved performance? This question cannot be answered with an unequivocal "yes" or "no" because comparative empirical data are not yet available. "Yes", because a large increase in student satisfaction with the course and learning outcomes was reported; "yes" because in the major areas, a significant decrease in errors did occur; "no", remedial instruction did not bring about a reduction of errors in all areas of the language, but this is probably the fault of inadequate remedial treatment, not of performance analysis itself. A further problem is the avoidance phenomenon which is observed

when a student who is unsure about a linguistic form or its usage avoids it altogether; performance analysis, just like error analysis, as Schachter (1974) has pointed out, would provide no data as to the error status of that element.

(2) Performance analysis reflects the current emphasis on humanizing learning; it allows the participants in an oral communication situation to concentrate fully on the interaction itself because they know that the taping will provide an accurate data base for cooperative assessment of the linguistic aspect of the performance. The instructor does not have to resort to furtive scribbling, subverbal counting of errors and other impressionistic means of error collection. The students, on the other hand, are involved in instructional design as they should be as consumers. They know they are being evaluated fairly, nonpunitively and - what is most important - constructively because they can judge their own performance from the same criteria which were available to the instructor for marking.

(3) Performance analysis shows its greatest promise in its capability to provide a data base for the empirical measurement of the time and effort required to overcome an error; (Banathy and Lange, 1972, p. 80); in this manner, item difficulty can be quantified, and a pedagogical grammar can be written which organizes instructional modules around learning problems on the basis of real, empirically determined item difficulty, not according to allegedly scientific criteria or the whim of a textbook author.

Nemser and Slama-Cazacu (1970) had suggested that studies be made of large samples of errors by the longitudinal method (viz. following a student or group of students over a period of time in their development of foreign language competence) and by the transversal method, that is by sampling students' errors at different stages in the learning process. The former method, of course, produced the error profiles, and Illustration 9 provides the results of a tabulation of error frequencies for Beginning, Intermediate and Advanced students. While the findings are far from being unequivocal or conclusive, a pattern appears to emerge which parallels the development of course objectives, viz. increased versatility of expression, which is more likely to lead to errors than tightly organized first-year communication situations: many error categories which require close adherence to rules seem to become smaller in size while those where forms and usage are less predictable (e.g. semantic selection, spelling, gender) increase from the first to the third year. And yet, a commonality of error occurrences is apparent as can be seen in the fact that the first 13 error classes on the list account for roughly 50% of all errors on the three levels.

Further research could examine the relationship between the frequency of use and frequency of correct use of a foreign-lan-

guage element on the various levels of instruction in, say, the ten most frequently occurring error classes. This analysis could be performed for use of certain items in speaking versus writing; preliminary evidence collected here indicates that the effectiveness of remedial instruction for the linguistic improvement of oral communication lags considerably behind improvement in written expression; furthermore, such improvement is much more gradual.

There are still problems to be overcome, of course. For example, supplying the number of errors without reference to the number of items used correctly provides only a very crude, classroom-use-oriented measure of the effectiveness of instruction and remediation. Illustration 10 on the Handout illustrates the point that, in the given case, not only did remediation decrease the number of errors observed, it did so while, on the one hand, the percentage of correct usage increased and, on the other, students used more of these items. It is clear that for precise measurement for research, not feed-back purposes, more sophisticated techniques will have to be employed, such as have been described, for example, by Buteau (1970) and Dulay and Burt (1974) in a study of Functors.

Research must be undertaken to determine empirically some of the parameters of pedagogical grammars and their implementation in actual course designs, and it is hoped that performance analysis can make a contribution there.

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SYSTEMATIC PERFORMANCE ANALYSIS IN FOREIGN LANGUAGE INSTRUCTION AND LANGUAGE PLANNING

(M. Prokop)

Handout

Ill. 1: Background Information

	Beginners	Intermediates	Advanced students
Number of students	21	22	19
Text size	6,120	12,284	13,470
Number of errors	815	1,752	1,557

Ill. 2: Excerpts from coding sheet

Correct use	Descriptor	Correct form						
		Nom.	Acc.	Dat.	Gen.	Plural Nom. Acc	Plural Dative	Plural Genitive
	der-words	1	2	3	4	5	6	7
	der-w after prep	8	9	10	11	12	13	14
	ein-words	15	16	17	18	19	20	21
	eine after prep	22	23	24	25	26	27	28
-	adj after der-w	29	30	31	32	33	34	35
	after mens	36	37	38	39	40	41	42

907	Agreement between subject & verb		880	Prefix selection by verb	
			881	Passive, true	
873	Article		882	Passive, "false"	
841	Capitalization		858	Preposition selection: verb	
894	Case selection of verb				
910	Case selection of noun adjec		859	Preposition selection: noun or adjective	
842	Comparison: comparative	501			

605	[x]	633	[st]	
606	[d]	634	[t], also in	final devoicing and before -s, -t
607	[f]	635	[ts]	
608	[g]	636	[tsv]	
609	[gn]	637	[tš]	

Ill. 3: Error/Word Ratio

Assignment: 01

Number of words: 71 Number of errors: 5
Error/word ratio * 100 = 7.04, which means that there were 7.04 errors per 100 words

Ill. 4: Individual Error Profile

Code	Assignment	Actual number of errors	Percentage of total number	Verbal descriptor or code
409	02	1	6.25	Correct position of inflected verb in the subordinate clause.
	04	1	8.33	
	05	2	22.22	
	06	1	7.14	

Ill. 5: Error Cluster Profile

Assignment	Number of occurrences	Cluster
02	4	23: Correct word order
04	5	
05	2	
06	2	

Ill. 6: Individual Error Summary for the Last Sampling

Code	Assignment	Actual number of errors	Number of students making the error	Percentage of total number	Verbal description of code
401	06	5	3	5.26%	Correct position of verb in main clause

Ill. 7: Error Cluster Summary for the Last Sampling

Assignment	Number of occurrences	Number of students	Cluster description
06	20	4	13: Correct form of a word in the nominative or accusative plural

Ill. 8: Cumulative Error Summary

Code	Assignment	Actual number of errors	Number of students making error	Percentage of total number of errors	Verbal description of code
111	01	6	3	4.41	Correct ending of noun in the nominative or accusative plural
	02	2	2	2.44	
	03	3	3	1.53	
	04	2	1	0.92	
	05	6	4	6.74	
	06	5	3	5.26	

Ill. 9: Error Frequencies (written work) for 3 Instructional Levels

Error Code	Beginners (N=815)	Intermediates (N=1,752)	Advanced (N=1,557)
Spelling	8.2%	10.0%	14.6%
Inflected verb in main sentence	7.9	3.1	*
Semantic selection: situational context	6.6	4.0	10.4
Noun stems and suffixes	6.3	2.8	6.6
Inflected verb in subord. clause	5.3	3.1	1.3
Endings of ein-words	5.3	6.3	3.5
Endings of der-words	4.1	4.6	5.5
Preposition selection of verbs	3.1	3.3	2.4
Semantic selection: translation	3.0	3.2	3.0
Correct uninflected verb form	2.7	2.1	1.0
Ending of unpreceded adjectives	2.6	*	1.6
Repetition of spelling error	2.3	5.5	2.5
Capitalization	2.1	5.4	6.0
Agreement between subject + verb	2.1	*	1.2
Conjunctions	2.0	1.9	*
Use of article	1.8	1.0	2.2
Adjective endings after der-word	1.8	*	4.3
Suffix in Simple Past	1.7	1.8	*
Adjective ending after ein-word	1.6	1.3	1.4
Relative pronouns	1.5	*	*
Word linking	1.5	*	*
Past tense stem	1.0	1.1	1.0
Use of Past	*	4.1	*
Gender of noun	*	2.2	3.4
Choice of prefix by verb	*	2.1	3.2
Case selection of verb	*	1.2	2.1
Personal pronouns	*	1.6	*
Preposition selection of noun +ad.	*	*	2.2
False passive	*	*	1.7
Agreement between noun and pronoun replacing it	*	*	1.2
Subjunctive	*	*	1.0
	74.1%	72.6%	85.4%

* = frequency of less than 1% of the total

Ill. 10: Number of errors and percentage of correct usage of adjectives after der-words (Beginners)